Civil Infrastructure Management

Managing today's civil infrastructure for reliability, cost efficiency and service

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Managing Civil Infrastructure Systems

Management of a civil infrastructure(s) (i.e., water distribution system, multiple hydroelectric projects, levee system, rail systems, etc.) is a complex balancing act. The costs of operations are high and the demands varied. As a manager of a civil infrastructure, consider these questions:

Is an increasing part of your budget spent on inspection and maintenance, and minor/major repairs?

Do you have concerns about downtime, production loss, or liability?

Is the reliability of your system decreasing due to aging?

Are you facing increased exposure to liability?

Is maintaining reliability and minimizing risk at a reasonable cost an objective your organization is trying to achieve?

If the answer to any of these questions is yes, we may be able to help. Our approach to Civil Infrastructure Management can provide you a decision-support system based on engineering reliability methods, database management and optimization.

To learn more, read on or give us a call now!

Telephone: (415) 473-9955 **Ask for: Martin McCann**

What do we mean by a civil infrastructure?

A civil infrastructure is any civil system or group of systems that may be physically and/or functionally contiguous or a series of discrete facilities/sites under the same management. Examples of continuous systems include highways, water distribution systems, rail systems, etc. Examples of discrete facilities include dams, storm drainage culverts, bridges, waste-water processing plants, etc.

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Challenges of Infrastructure Management

As our nation's infrastructure ages, there are a diversity of challenges that must be balanced as part of day-to-day and long-term management. These challenges include:

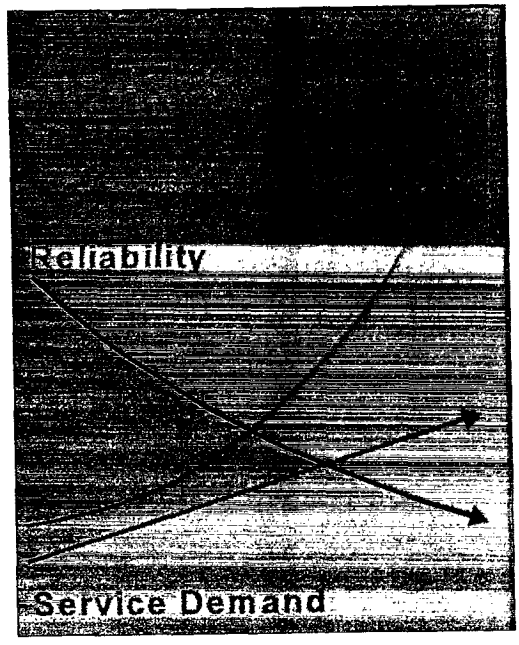
- demand for;
  - increased service or production,
  - improved system reliability, and
  - improved quality of service
- regulations requiring improved worker & public safety,
- increasing market competition,
- pressure to reduce the cost of operations (e.g., maintenance activities),
- wear-out and deterioration that reduces a system's integrity, and
- increased fiscal pressure to do more with less.

In this complex environment, tools are required that can provide management with information on the condition and reliability of a system. In addition, input is required to facilitate critical decisions related to maintenance scheduling, budgeting, life-cycle cost assessment, the quality and reliability of service, and scheduling system or component replacement.

JBA has a unique background in the area of reliability assessment for civil infrastructure systems. We can provide you with the tools to develop an effective decision support system to facilitate infrastructure management. Our approach to civil infrastructure management can be used to develop a custom decision-support system. The system can consider alternatives that minimize cost, take into account the chance for system failure and the importance of subsystems (e.g., a subset of an infrastructure) to operations in recommending optimum strategies. A foundation of this approach is known as reliability centered maintenance (RCM), which has proven to be an effective means to support operation and maintenance planning and to reduce costs.

Developed in the 1960's in the aerospace industry, reliability-centered maintenance (RCM) has become a standard in system management. It provides a logical, balanced approach to evaluate a system and to establish a strategy for cost-effectively maintaining reliable performance. RCM has been applied in areas such as the electric power industry, highway bridge maintenance, among others.

Management Challenges



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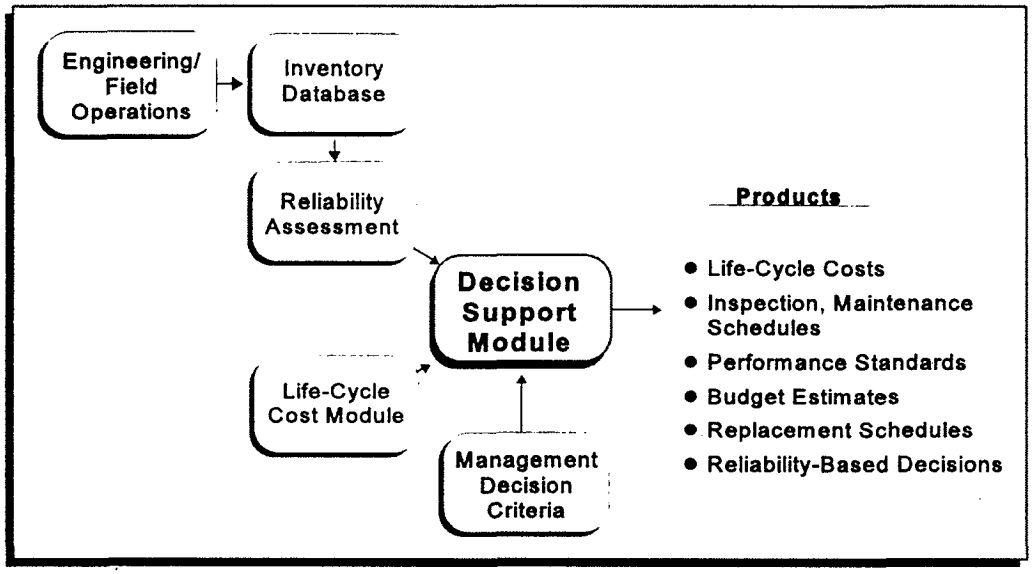
Meeting the Challenge

To meet the challenges of infrastructure management, JBA engineers can work with your staff to develop a custom PC-based decision-support system. Using reliability methods, a decision-support system can be used to set and meet infrastructure performance requirements and minimize costs.

A decision-support system provides the infrastructure manager with an information resource on a system (i.e., inventory, maintenance records, performance history), a means to assess system reliability, and information resources and tools that aid in balancing critical factors, while meeting management objectives. The following figure shows the elements of a decision-support system.



Tasks that can be performed by a decision-support system include:

- perform life-cycle assessments,
- address 'what-if' questions related to maintenance scheduling,
- make short- and long-term budget projections,
- schedule component inspections, maintenance, and replacement.

A decision-support system can be a valuable tool that facilitates management efforts to maintain reliable services, while also controlling costs.

We can help you develop a decision-support system to meet your management requirements.

For more information, give us a call.

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JBA General Services

JBA provides services in a wide range of areas centered around our civil/structural engineering background and extensive experience in the application of probabilistic methods to civil engineering problems. Our services include:

- Structural and seismic engineering
- Risk and reliability assessments for critical facilities (e.g., dams, lifelines, chemical facilities, power plants)
- Risk-based decision analysis
- Civil infrastructure risk management
- Standards development
- Statistical analysis and sampling methods
- Natural hazards assessment
- Natural hazards risk management
- Facility walkdown and vulnerability assessment
- Portfolio risk evaluation for natural hazards
- Independent reviews

For the past eighteen years JBA has worked for government and regulatory agencies, private corporations, the electric utility industry and engineering construction firms. We approach each project with the objective of providing practical solutions with the highest technical quality.

You can contact:

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